REMARKS

The specification has been amended to correct a typographical error.

Favorable consideration and allowance are respectfully requested for claims 1 and 4 in view of the foregoing amendments and the following remarks.

In the Office Action dated April 28, 2003, claim 2 was objected to because of certain informalities; claims 1 and 4 were rejected under 35 U.S.C. § 103(a) as being unpatentable over JP 08-000950 to Tamaru et al. ("Tamaru"); claim 2 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Tamaru in view of JP 07-031841 to Hiroo et al. ("Hiroo"); claim 3 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Tamaru in view of US 3,825,286 to Henry ("Henry") and US 3,005,369 to Koster ("Koster"); and claims 5 and 6 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Tamaru in view of US 5,403,522 to Von Berg ("Von Berg").

These rejections are respectfully traversed and, to the extent they relate to claims 2, 3, 5, and 6, are rendered moot by the foregoing amendments.

Rejection(s) under 35 U.S.C. § 103(a)

Claim 1 has been amended to more particularly define the invention and to clearly distinguish over Tamaru and the remaining prior art of record. In particular, claim 1 now incorporates certain elements previously recited in claim 3. Applicants believe amended claim 1 is now is allowable form, for at least the following reasons.

The shape of the semicircular trough which is the end portion of the air-blowing pipe is not disclosed in Tamaru, or the other references of record. The shape of this semicircular trough is related to the efficiency of the apparatus, and the effects of the particular shape are disclosed at least on page 14, line 7 to line 16 and page 15, line 18 to line 29 of the specification.

In the present invention, the air-blowing pipe has an end portion which has a semicircular shape, the internal diameter of the branch pipe is D, and the insertion point of the air-blowing pipe into the branch pipe is located between 3D and 10D from the discharge end of the branch pipe. By inserting the air-blowing pipe into the branch pipe so that the central axis of said air-blowing pipe meets with the central axis of said branch pipe at an angle, and configuring the end of the air-blowing pipe in the branch pipe as a semicircular trough facing downstream towards the collection tank, in addition to the effects disclosed in the specification, it is possible to generate a cavity in the absorption liquid current by injecting air into the liquid, which forms a liquid-vapor mixture in the region of the cavity. This configuration can also suppress erosion of the pipe and minimize pressure fluctuations in the liquid.

In Henry, as shown in Figure 4, (air-blowing) pipe 47 is inserted into (branch) pipe 41. The pipe 47 is, however, merely inserted into pipe 41 by an angle, and the end of pipe 47 is not configured as a semicircular shape. In Koster, the pipe 12 shown in Figure 3 has a semicircular shape before the second operation but the end portion of pipe 12 is simply connected to pipe 11 at an

angle, and pipe 12 does not extend into pipe 11, as shown in Figure 1 and Figure 2. Furthermore, as shown in Figure 8 and Figure 9, the end portion is not positioned in the absorption liquid circulation pipe.

Claims 2 and 3 are no longer pending as they have been cancelled by this Amendment.

With respect to claim 4, the Office Action indicated the listed numerical ranges overlap ranges cited in Tamaru and were therefore obvious. However, given the semicircular shape of the end portion of the air-blowing pipe, the dimensional relation between the end portion and the branch pipe is not insignificant. If the diameter of the end portion is not between 0.4D and 0.7D, then the absorption liquid can not flow easily through the constricted areas 3c, above and below, or to the left and right of the air pipe, which can be seen in Figures 2 (B) and 3 (B).

Further, claim 4 should be in allowable form as it depends from claim 1, which it now believed to be allowable.

Claims 5 and 6 are no longer pending as they have been cancelled by this Amendment.

With respect to pending claims 1 and 4, applicants also offer the following. In a desulfurizing apparatus, slurry liquid is used for the desulfurizing process. The slurry liquid is characteristically acidic, and it is mainly composed of crystal components which are generated by a high density gypsum reaction. The slurry is also characteristically abrasive. As disclosed in the specification, the pressure

and the flow speeds of the liquid in the region where the air and slurry meet again in the pipe will fluctuate. A desirable system, therefore, should be practically configured so that the desulfurizing apparatus has enough durability for these environments, and it should have various improvements in the pipes, which influences the length of life of the apparatus. In this invention, as explained herein and in the specification, there are many disclosures for solving such problems, and the invention is believed non-obvious in light of the cited references.

The semicircular shape of the end portion of the air-blowing pipe allows air to flow into the cavity created thereby, quickly stabilizing and eliminating the cavity formed in the pipe by the injection of the air. This configuration minimizes pressure fluctuations in the liquid and curtails erosion in the pipe.

The references of record in the present application do not disclose or suggest the particular combination or arrangement of elements recited in pending claims 1 and 4.

Accordingly, withdrawal of the rejection of claims 1 and 4 is respectfully requested.

CONCLUSION

In view of the foregoing, the application is respectfully submitted to be in condition for allowance, and prompt favorable action thereon is earnestly solicited.

If there are any questions regarding this response or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response; please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Attorney Docket No. 037083/48707US).

Respectfully submitted,

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